CLAIMS

1. A fuel cell system including a fuel cell that generates electricity through an electrochemical reaction between a fuel gas and an oxidizing gas, and a load device which is supplied with electric power from the fuel cell, the fuel cell system being characterized by comprising:

a gas supply unit that supplies each of the fuel gas and the oxidizing gas to an anode and a cathode of the fuel cell, respectively by quantity corresponding to a load of the load device;

a gas permeation quantity estimation unit that estimates a gas permeation quantity of at least one of the fuel gas and the oxidizing gas between the anode and the cathode after the fuel cell is stopped; and

a correction unit that corrects a supply quantity of at least one of the fuel gas and the oxidizing gas each corresponding to the load in accordance with the estimated gas permeation quantity, which is to be supplied by the gas supply unit upon a subsequent start of power generation.

2. The fuel cell system according to claim 1, characterized in that the gas permeation quantity is estimated based on a drop rate of an open circuit voltage after the power generation performed by the fuel cell is stopped.

3. The fuel cell system according to claim 2, characterized in that the drop rate of the open circuit voltage is calculated based on an amount of a voltage drop that has occurred between the anode and the cathode due to a leakage of the fuel gas to the cathode and a leakage of the oxidizing gas to the anode after the power generation performed by the fuel cell is stopped, an elapsed time from when the power generation performed by the fuel cell is stopped, and a function which has been obtained through experiment or simulation calculation preliminarily.

4. The fuel cell system according to claim 1, characterized in that the gas permeation quantity is estimated based on a gas pressure decrease rate in the fuel gas after the power generation performed by the fuel cell is stopped.

5. The fuel cell system according to claim 4, characterized in that the gas pressure decrease rate is calculated based on the estimated gas permeation quantity which has been obtained through experiment or simulation calculation preliminarily based on a fuel gas pressure in the anode after the power generation performed by the fuel cell is stopped, a decrease in the fuel gas pressure for an elapsed time from when the power generation performed by the fuel cell is stopped until when the power generation performed by the fuel cell is restarted, and the elapsed time.

6. The fuel cell system according to claim 1, characterized in that the correction unit independently sets each of a correction amount of the fuel gas and a correction amount of the oxidizing gas based on the estimated gas permeation quantity.

7. The fuel cell system according to claim 1, characterized in that the gas permeation quantity estimation unit independently estimates each of the gas permeation quantity of the fuel gas and the gas permeation quantity of the oxidizing gas.

8. The fuel cell system according to any one of claims 1 to 7, characterized in that the fuel cell is brought into a stopped state in an intermittent operation mode of the fuel cell.

9. A gas control method of a fuel cell system including a fuel cell that generates electricity through an electrochemical reaction between a fuel gas and an oxidizing gas, and a load device which is supplied with electric power from the fuel cell, characterized by comprising the steps of:

supplying each of the fuel gas and the oxidizing gas to an anode and a cathode

of the fuel cell, respectively by quantity corresponding to a load of the load device;

estimating a gas permeation quantity of at least one of the fuel gas and the oxidizing gas between the anode and the cathode after the power generation performed by the fuel cell is stopped; and

correcting a supply quantity of at least one of the fuel gas and the oxidizing gas corresponding to the load in accordance with the estimated gas permeation quantity, which is to be supplied upon a subsequent start of power generation.